

REMARKS

Claims 20 to 23, 26, and 27 were pending in the present application when last examined. Applicant has amended claims 20, 21, 23, and 26. Claims 20 to 23, 26, and 27 remain pending in the present application.

Objection to the Abstract

The Examiner objected to the Abstract for using legal language. Applicant has amended the Abstract to remove any legal language and to correct a typographical error.

§102 Rejections

Claims 20 and 22

The Examiner rejected claims 20 and 22 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,232,150 ("Lin et al."). Addressing claim 20, the Examiner stated that Lin et al. discloses "a perimeter (see figure 2b) of an intermetallic mixture interposed between the first wafer and the second wafer, the intermetallic mixture comprising material from a reactive foil (aluminum microheater) and a bonding material, the intermetallic mixture being formed after an exothermic reaction of the reactive foil (see figures 13, 14a-14b, col. 4, lines 10-35)." January 24, 2006 Office Action, p. 2. Applicant respectfully traverses.

The Examiner cited the microheater of Lin et al. as the recited "reactive foil" in claim 20. However, the two elements are quite different. The microheater disclosed by Lin et al. is a resistance heater that produces heat when a current is passed through the heater. "The microheater may be formed from a variety of materials so long as they are electrically conductive and suitable for operation as a resistance heater." Lin et al., col. 7, lines 17 to 19. On the other hand, the "reactive foil" recited in claim 20 is a chemical heater that produces an exothermic reaction (a chemical reaction producing heat) when initiated. "Reactive foil 16 includes alternating layers of reactive materials (e.g., aluminum and nickel) that produces an exothermic reaction when initiated." Specification, p. 3, paragraph 16. This distinction is reinforced in claim 20 by reciting that "the intermetallic mixture being formed after an exothermic reaction of the reactive foil." Thus, claim 20 is patentable over Lin et al.

Claim 22 depends from claim 20 and is patentable for at least the same reasons as claim 22.

Claims 26 and 27

The Examiner rejected claims 26 and 27 under 35 U.S.C. §102(b) as being anticipated by Lin et al. Addressing claim 26, the Examiner stated that Lin et al. discloses "an intermetallic mixture interposed between the device and the metal lines, the intermetallic mixture comprising materials from a reactive foil (aluminum microheater) and a bonding material, the intermetallic mixture being formed after an exothermic reaction of the reactive foil (see figures 13, 14a-14b, col. 4, lines 10-35). January 24, 2006 Office Action, p. 3. Applicant respectfully traverses.

Claim 26 has similar limitations as claim 20. Thus, claim 26 is patentable over Lin et al. for at least the same reasons that claim 20 is patentable.

Furthermore, the figures and the columns of Lin et al. cited by the Examiner do not disclose an intermetallic mixture that bonds a device to a metal line, where the intermetallic mixture has materials from a reactive foil and a bonding material.

Specifically, Fig. 13 does not even illustrate a device bonded on a substrate. Instead, Fig. 13 simply illustrates "an example of a small scale experimental testing setup executing and implementing the method process and related structure" Lin et al., col. 8, line 66 to col. 9, line 2.

Fig. 14a also does not illustrate a device bonded on a substrate. Fig. 14a simply illustrates a "localized, indirect bonding process[] which incorporates intermediate layers ... specifically PSG-to-glass fusion bonding." Lin et al., col. 14, lines 34 to 36.

Fig. 14b illustrates a dew point sensor on a Si substrate. However, Lin et al. is silent as to if and how the dew point sensor is bonded on the Si substrate. Otherwise, Fig. 14b simply illustrates a "localized, indirect bonding process[] which incorporates intermediate layers ... specifically ... Indium-to-glass bonding." Lin et al., col. 14, lines 34 to 37.

Col. 4, lines 10 to 35 of Lin et al. is the Summary of the Invention. The Summary normally does not provide an enabling disclosure, which is normally provided by the Detailed Description. Even assuming that Summary does provide an enabling disclosure, it nonetheless does not disclose an intermetallic mixture that bonds a device to a metal line, where the intermetallic mixture has materials from a reactive foil and a bonding material. Instead, the Summary generally describes a microheater for bonding two substrates. Accordingly, claim 26 is patentable over Lin et al.


Claim 27 depends from claim 26 and is patentable for at least the same reasons as claim 26.

Allowable Subject Matter

The Examiner stated that claims 21 and 23 would be allowable if rewritten in independent form including all the limitations of their base claim and any intervening claims. Applicant has amended claims 21 and 23 as recommended by the Examiner. Thus, claims 21 and 23 are in condition for allowance.

Summary

In summary, claims 20 to 23, 26, and 27 were pending in the above-identified application. Applicant has amended claims 20, 21, 23, and 26. For the above reasons, Applicant respectfully requests allowance of claims 20 to 23, 26, and 27. Should the Examiner have any questions, please call the undersigned at (408) 382-0480x206.

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Respectfully submitted,



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